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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/791,295

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Yoshinobu Suehiro

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07/20/2006

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EXAMINER

ARENA, ANDREW OWENS

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 07/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/791,295	Applicant(s) SUEHIRO ET AL.	
	Examiner Andrew O. Arena	Art Unit 2811	

**– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –  
Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.  
 2a) ☒ This action is FINAL.                      2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 26-37 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-11 and 26-37 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 07/08/2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☒ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action (dated 01/31/2006).

Claims 1, 2, 4, 33, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Juestel (JP Pub 2002-223008).

A machine translation from the JPO website of the Juestel reference was provided in a prior office action (dated 01/31/2006) and is referred to herein.

**Regarding claim 1**, Juestel discloses (Drawing 1) a light emitting apparatus (1), comprising:

a semiconductor light emitting element (3) that emits light with a predetermined wavelength ([0027] ln 5);

a light-transmitting portion (6; [0024] ln 1-3) that includes a recess (at 2) to house the semiconductor light emitting element (3), the light-transmitting portion being of a light-transmitting material ([0024] ln 1-3) and the recess being formed with a predetermined size; and

a phosphor layer portion (4; [0024] ln 5) that is thinly formed along the surface of the recess, the phosphor portion including a phosphor to be excited by irradiating light emitted from the semiconductor light emitting element (inherent in fluorescent substance, [0024] ln 5).

The product-by-process limitation "provided by molding the light-transmitting material" has not been given patentable weight. See MPEP § 2113.

**Regarding claim 2**, Juestel discloses (Drawing 1) the light-transmitting portion has a light convergence shape to converge light (inherent in the convex lens shape 6) emitted from the light emitting element ([0024] ln 1-3).

**Regarding claim 4**, Juestel discloses (Drawing 1) the recess is located close to the semiconductor light emitting element along the profile of the semiconductor light emitting element (apparent in Drawing 1).

**Regarding claim 33**, Juestel discloses said light emitting element emits light having a wavelength of 450nm (¶13).

**Regarding claim 35**, Juestel discloses (Drawing 1) said phosphor layer portion (2) comprises uniform thickness.

Claim 37 is rejected under 35 U.S.C. 102(b) as being anticipated by Lowery (5,959,316).

**Regarding claim 37**, Lowery discloses (Fig 1 + Fig 4) a light emitting apparatus, comprising:

a light emitting element (18; col 2 ln 8) that emits light with a predetermined wavelength;

a molded lens (26) comprising a recessed portion (in which 18 lies) which has a predetermined size and is formed over said light emitting element; and

a phosphor layer (Fig 4: 66; col 2 ln 44) formed on a surface of said recessed portion, said phosphor layer including a material (col 2 ln 19) which is excited by light emitted from the light emitting element,

wherein a sealant (64; col 2 ln 43) is formed between said light emitting element and said phosphor layer, for sealing said light emitting element).

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action (dated 01/31/2006).

Claims 3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juestel as applied to claim 1 above, and further in view of Roberts (US 6,335,548).

**Regarding claim 3**, Juestel discloses the semiconductor light emitting element is an LED element (abstract ln 1-2) that emits light from its light emission surface located on the opposite side of its mounting surface (light is emitted from said surface).

Juestel differs from the claimed invention only in not expressly disclosing a flip-chip type LED.

Roberts teaches the use of a flip-chip type LED (col 20 ln 15-37).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that the LED of Juestel is a flip-chip type LED, as taught by Roberts; at least to extend operation (Roberts: col 20 ln 33-37).

**Regarding claim 5**, Juestel differs from the claimed invention only in not disclosing a plurality of LED elements.

Roberts teaches (Fig 19) a plurality of LED elements (col 29 ln 64-65).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Juestel in view of Roberts such that the semiconductor light emitting element is composed of a plurality of LED elements disposed in a predetermined arrangement; at least to produce light of any color desired (Roberts: col 30 ln 12-20).

**Regarding claim 6**, Juestel differs from the claimed invention only in not disclosing a plurality of LED elements.

Roberts teaches (Fig 19) a plurality of LED elements (col 29 ln 64-65) with different emission wavelengths (col 30 ln 12-14).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Juestel in view of Roberts such that the semiconductor light emitting element is composed of a plurality of LED elements with different emission wavelengths disposed in a predetermined arrangement; at least to produce light of any color desired (col 30 ln 12-20).

Claims 7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juestel in view of Roberts.

**Regarding claim 7**, Juestel discloses the structure of claim 1, therefore inherently disclosing the steps of:

preparing a light-transmitting portion (6) that includes a recess (at 2) to house a semiconductor light emitting element (3),

the light-transmitting portion being of a light-transmitting material ([0024] ln 1-3) and the recess being formed with a predetermined size by molding (shaping) the light-transmitting material,

the recess being provided with a phosphor layer (4; [0024] ln 5) that is thinly formed along the surface of the recess such that the phosphor layer of the recess surrounds an upper portion of the semiconductor light emitting element.

Juestel differs from the claimed invention only in not expressly disclosing how contact to the light emitting apparatus is made.

Roberts discloses (Fig 19) a light emitting apparatus, inherently disclosing a method for making said light emitting apparatus, comprising:

forming an electrode (1902) of metal material (col 25 ln 13);

mounting a semiconductor light emitting element (1909) on (indirectly, by way of 203) the electrode;

positioning a light-transmitting portion (401) adjacent to the electrode; and

bonding the light-transmitting portion onto the electrode.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the method Juestel in view of Roberts to further comprise: forming an electrode of metal material; mounting the semiconductor light emitting element on the electrode; positioning the light-transmitting portion adjacent to the electrode; and bonding the light-transmitting portion onto the electrode such that the

phosphor layer of the recess surrounds an upper portion of the semiconductor light emitting element; at least to allow electrical connection to the apparatus of Juestel.

**Regarding claim 9**, Juestel as modified above discloses (Roberts Fig 19b) the electrode is a lead electrode (1902; col 30 ln 6-7) provided on (indirectly, via 203) the surface of a submount member (204) of high thermal conductivity (col 10 ln 47, 54).

**Regarding claim 10**, Juestel as modified above discloses (Roberts Fig 19b) the electrode is a copper-foil electrode (col 12 ln 28-29, 41-42) provided through an insulation layer (203; col 9 ln 6) on the [side] surface of a base member (204) of high thermal conductivity (col 10 ln 47, 54).

**Regarding claim 11** Juestel as modified above differs from the claimed invention only in not expressly disclosing a flip-chip type LED.

Roberts discloses the semiconductor light emitting element is flip-chip (col 20 ln 15-37) bonded onto the electrode (col 20 ln 24-29).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that the LED of the combined is a flip-chip type LED, as taught by Roberts; at least to extend operation (Roberts col 20 ln 33-37).

Claim 8 is rejected under 35 USC 103(a) as being unpatentable over Juestel in view of Roberts as applied to claim 7 above, further in view of Mueller (US 6,417,019).

**Regarding claim 8**, Juestel as modified above discloses the phosphor layer is formed on the surface of the recess formed by molding (Juestel: 4; [0024] ln 5).

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Juestel as modified above differs from the claimed invention only in not expressly disclosing spraying a phosphor material.

Mueller teaches spraying a phosphor material (col 7 ln 19-20).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to spray the phosphor material, as taught by Mueller, on the surface of the recess of Juestel after forming the recess; at least to utilize a known phosphor layer deposition method (Mueller: col 7 ln 19-20).

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juestel as applied to claim 1 above, and further in view of Lowery.

**Regarding claim 26**, Juestel differs from the claimed invention only in not disclosing a sealant formed between the light emitting element and the phosphor layer.

Lowery discloses (Fig 4) a sealant (64; col 3 ln 27) formed between said light emitting element and said phosphor layer (66; col 3 ln 29). Lowery discloses said sealant comprises a viscous, transparent, UV cured resin (col 3 ln 21-24).

Lowery does not expressly disclose the material of the transparent resin.

Examiner takes official notice that silicon resin is a well-known UV cureable resin.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Juestel in view of Lowery such that a sealant is formed between said light emitting element and said phosphor layer portion, for sealing said light-emitting element, wherein said sealant comprises a transparent silicon resin; at least to prevent the annular ring problem (Lowery: col 3 ln 33).

Claims 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juestel as applied to claim 1 above, and further in view of Chen (US 6,531,328).

**Regarding claim 27**, Juestel differs from the claimed invention only in not expressly disclosing how contact to the light emitting apparatus is made.

Chen discloses (Fig 14) a plurality of leads (17, 18) and a submount (8) formed on said plurality of leads, said light emitting element (3) being formed on said submount.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that Juestel use a connection structure similar to Chen, comprising a plurality of leads and a submount formed on said plurality of leads, said light emitting element being formed on said submount; at least to allow electrical connection to the apparatus of Juestel.

**Regarding claim 28**, Juestel as modified above discloses said submount comprises a thermally conductive submount (Chen: col 5 ln 66).

**Regarding claim 29**, Juestel as modified above discloses said light transmitting portion is formed (indirectly) on said plurality of leads, said recess being aligned with said light emitting element.

**Regarding claim 30**, Juestel as modified above discloses (Chen: Fig 14) a wiring pattern (17a) formed on said submount, said light emitting element (3) being mounted on said wiring pattern.

**Regarding claim 31**, Juestel as modified above discloses (Chen: 14) said light emitting element is flip-chip bonded through bumps (21) onto the wiring pattern.

**Regarding claim 32**, Juestel as modified above discloses (Chen: Fig 8) said submount (8) comprises a viahole (14) said wiring pattern (17a) being electrically connected though said viahole (col 5 ln 37-38) to said lead (17).

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juestel as applied to claim 1 above, and further in view of Keller (US 2004/0012027).

**Regarding claim 34**, Juestel differs from the claimed invention in not disclosing said phosphor comprises Ce:YAG.

Keller teaches that Ce:YAG is a typical phosphor.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that, in view of Keller, said phosphor layer portion comprises Ce:YAG; at least to use a typical phosphor.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juestel as applied to claim 1 above, and further in view of Lowery.

**Regarding claim 36**, Juestel differs from the claimed invention only in not disclosing a sealant formed between the light emitting element and the phosphor layer.

Lowery discloses a structure (Fig 4), inherently disclosing a method for making said structure, comprising:

forming a sealant (64; col 3 ln 27) between said light emitting element and said phosphor layer (66; col 3 ln 29, said forming said sealant comprising:

injecting (inserting) said sealant into said recess; and

fixing a light transmitting portion (68) onto said light emitting element such that said light emitting element is sealed with said sealant.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the method Juestel in view of Lowery to further comprise: forming a sealant between said light emitting element and said phosphor layer, for sealing said light emitting element, said forming said sealant comprising: injecting (inserting) said sealant into said recess; and fixing said light transmitting portion onto said light emitting element such that said light emitting element is sealed with said sealant; at least to prevent the annular ring problem (Lowery: col 3 ln 33).

### ***Response to Arguments***

Applicant's arguments filed 04/28/2006 have been fully considered but they are not persuasive.

Applicant's argument that "Juestel does not teach or suggest... 'the recess being formed with a predetermined size', as recited in claim 1 and similarly recited in claim 7" is not persuasive. Applicant has presented neither claim language nor evidence to structurally distinguish the claimed "predetermined size" from the Juestel reference.

In particular, applicant's alleged advantages of this claimed feature (pg 7-9) fail to structurally distinguish the claimed "predetermined size" from the Juestel reference.

Applicant's argument that "Juestel and Robers are unrelated" is not persuasive. Both Juestel and Roberts disclose packaged LED devices.

Applicant's argument that "the references provide not motivation or suggestion to urge the combination" is not persuasive. Juestel discloses an LED but does not disclose how electrical contact is made. One of ordinary skill in the art at the time the invention was made would have been motivated to seek an electrical contact scheme for Juestel. Roberts discloses an LED provided with electrical contact.

Applicant's argument that "Mueller is unrelated to Juestel and Roberts" is not persuasive. Both Juestel and Mueller disclose phosphor-based layers in packaged LED devices. Both Roberts and Mueller disclose packaged LED devices.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is (571) 272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrew O Arena  
9 July 2006

Steven Loke  
Primary Examiner  
*Steven Loke*